NORTH EAST LINK PROJECT - NET COMMUNITY BENEFIT REVIEW

EXPERT EVIDENCE
JULY 2019

Prepared for
Maddocks on behalf of Banyule City Council, Boroondara City Council and Whitehorse City Council
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EXECUTIVE SUMMARY

1. The proposed North East Link will provide a new freeway connection between the M80 Ring Road and Eastern Freeway. As currently proposed, the North East Link is Victoria’s most expensive road project.

2. The assessment of net community benefit of the North East Link is estimated via a cost benefit analysis. This cost benefit analysis suggests that the project will deliver a net benefit to Victoria. The Benefit Cost Ratio (BCR) of the North East Link is estimated to be 1.25. That is for each $1 of cost there is $1.25 of community benefits.

3. The BCR used to assess the net community benefit of the North East Link follows the standard approach for assessing toll road projects. These standards have been set in the Australian Transport Assessment & Planning guidelines and other relevant Government standards. In recent history, other toll road projects were assessed using these same standards and produced a positive BCR. However, upon their opening, it was found that many of the benefits which had supported the positive BCR were merely theoretical and did not exist in the real world.

4. Traffic volumes on these failed toll roads were often less than half of the expected traffic volumes estimated during the preparation of the BCR. In the face of these low traffic volumes, these toll roads experienced a rapid financial collapse. The North East Link shares similarities to these failed projects (in terms of not offering large travel time savings and competing with a free road as an alternative). Looking at these failed tolls roads and other factors relevant to projects of the scale of the North East Link raises concerns with the net community benefit of the project.

5. The construction cost of the project appears conservative. An assessment of previous transport projects has seen that on average, transport projects exceed their stated budget by an average of 26 per cent. If this was to occur with the North East Link, then the cost based on a 26 per cent budget overrun would see the costs of the North East Link exceed the benefits. In this case, the BCR would fall from 1.25 to 0.99.

6. Not all costs have been accounted for in the analysis. The loss of 30 hectares of open space, loss of native vegetation and the disruption of local businesses, which will reduce economic activity in Victoria, have not been considered in the BCR. These impacts should be considered as costs as part of the net community benefit. While these forgotten costs would not be in the hundreds of millions of dollars, they should still have been included in the assessment of the North East Link.

7. The traffic volumes under the North East Link Project could require duplication of the existing EastLink tunnels. This cost should be included in the BCR. This additional cost could result in the BCR falling from 1.25 to 1.02.

8. The removal of small travel time savings (of less than 5 minutes) from the transport modelling would reduce the BCR from 1.25 to around 0.6. Looking at previous failed toll roads, these small travel time savings are often not realised and can be considered too small to be a reliable measure in economic terms.

9. Business trips account for 25 per cent of the project benefits, which is hard to reconcile given the residential nature of the North East Link corridor. For example, the mostly residential suburbs of Greensborough, Eltham, Montmorency and Briar...
Hill and the new residential suburbs north of Mernda appear to make up a significant percentage of the business trips benefits.

10. These business trips have a significant impact on the North East Link benefits. The cost of time assigned to business travellers is $52.61 per hour compared with $16.22 for commuters. The $52.61 hourly value is based on Victorian average weekly earnings. When comparing Victorian average weekly earnings with the study area, average weekly earnings are 11.4 per cent less in the study area than the state average. As a result, the $52.61 is over stating the business trip benefits.

11. The Business Case assumes that 18 per cent of all vehicle kilometres trips are business trips. This is based on the Victorian average rather than local North East Link conditions. Examining available data from the Victorian Integrated Survey of Travel and Activity would suggest a more appropriate ratio for the study area would be around 14 per cent rather than 18 per cent.

12. Using this local value of business travel and lower split of business trips, the present value of the business benefit would fall to approximately 32 per cent (a reduction of $0.8 billion in benefits). This would reduce the BCR from 1.25 to 1.16.

13. There is no sensitivity analysis of the impact of the Airport Rail Link and Suburban Rail Loop. Without detailed modelling, it is very difficult to assess the impact of these rail projects. However, the Business Case does provide some clues to the scale of the impact of public transport projects.

14. Sensitivity testing in the Business Case shows that a constrained public transport network boosts the North East Link benefits by 17 per cent. Applying the same logic, a boost in the public transport network could reduce project benefits by 17 per cent. This would reduce the BCR to 1.04 from 1.25. Given this constraint applies to the current public transport network, this scenario would not be fully reflective of the impact of the Suburban Rail Loop. The Business Case contains a pessimistic scenario where benefits realised by the project are lower than expected. This produces a BCR of 0.5.

15. Taking a conservative approach, the midpoint BCR between the constrained public transport network and the pessimistic case is a BCR of 0.77. This could provide an insight into the impact of the Suburban Rail Loop and Airport Rail Link on the North East Link BCR.

16. An expansion factor of 330 days is used to convert daily benefits to annual benefits. A more conservative factor of 300 days would see the BCR fall from 1.25 to 1.14. This highlights how sensitive the transport benefits is to even a slightly more conservative assumption.

17. When considering the number of benefits that are likely to be overestimated and costs that may have been underestimated, it is very possible that there is no net community benefit from the North East Link.
1. PRELIMINARY INFORMATION

1.1 Credentials

18. My full name is Terry Paul Rawnsley. I am a National Leader of Economics and Social Analysis and a Principal and Partner of SGS Economics & Planning Pty Ltd (SGS). I am based in the firm’s Melbourne office at Level 14, 222 Exhibition Street, Melbourne, VIC, 3000.

19. SGS Economics and Planning (SGS) is a firm of urban economists and planners with offices across Australia. We provide advice to a variety of clients including the Commonwealth, state and local government departments as well as private and international clients.

20. I hold the following academic qualifications:
   - Bachelor of Economics (Honours) (James Cook University)

21. I have experience in applying economic theories and models to urban and regional issues across Australia and internationally. I have provided advice to all tiers of government related to the dynamics of transport impacts on the urban fabric, productivity, employment and the general economy. This includes business case development for road and rail projects and preparation of business impact assessment for Environment Effects Statement. I have worked for investors on toll roads in Sydney and Melbourne.

1.2 Instructions

22. My instructions in this matter, provided in writing on the 26th of June 2019 were to:

   a. Review the Ministerial Guidelines for assessment of environmental effects under the Environmental Effects Act 1978 (2006);
   b. review the exhibited North East Link Environment Effects Statement documents, relevant to my area of expertise;
   c. review the North East Link Business Case (Business Case), relevant to my area of expertise;
   d. review the Councils submission on the Environment Effects Statement, dated 7 June 2019;
   e. review the IAC report on Preliminary Matters and Further Information Request; and
   f. review any other submissions or documents.

23. Prepare an expert witness report that contains my expert opinion on the following matters, as relevant to my area of expertise:

   a. do the Environment Effects Statement and supporting documentation (including but not limited to the Business Case) adequately document and assess the costs and benefits of the Project for the purpose of determining whether the Project as a whole, or discrete parts of the Project, will result in a net benefit to the community?
   b. in addressing this question please explain where, in my expert opinion, are satisfied with the content of the Environment Effects Statement and Business Case and why, and if not, what if any deficiencies exist in the
documentation and/or assessment of the nature and extent of net community benefit impacts contained in the Environment Effects Statement;

24. In due course, review and comment on other parties’ expert evidence in relation to my area of expertise. Participate in any expert conclave requested by the IAC and present my evidence at the IAC Hearing. I anticipate preparing a short (no more than 30 minutes) presentation to facilitate the delivery of my evidence. The presentation is to be drawn from my expert witness report and may respond to other expert reports (as relevant).

1.3 Declaration

25. I have made all enquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from this expert evidence.

Terry Rawnsley
Principal and Partner
SGS Economics and Planning Pty Ltd
July 2019
2. INTRODUCTION

26. The proposed North East Link is Victoria’s most expensive road project. The North East Link will provide a new freeway connection between the M80 Ring Road and an upgraded Eastern Freeway. The question at hand is, do the Business Case and Environment Effects Statement adequately assess the costs and benefits to determine if there is a net community benefit.

2.1 Project Approach

27. In preparing this expert evidence, I have used the following approach:

- Reviewed the relevant sections of the North East Link Business Case, Environment Effects Statement and relevant supporting documents;
- Considered literature and case studies that explain the process of road project appraisal;
- Considered literature and case studies on failed transport appraisals and how they related to the North East Link; and
- Undertaken analysis to assess the costs and benefits of the North East Link to determine the robustness of the net community benefit.

2.2 Outline of this report

28. The remainder of this report is structured as follows:

- Section 3 presents an overview of cost benefit analysis / net community benefit and the recent history of toll road projects in Australia;
- Section 4 presents an outline of the North East Link;
- Section 5 assesses the costs and benefits of the North East Link and how it relates to the cost benefit analysis / net community benefit;
- Section 6 provides some concluding remarks;
- Appendix A contains case studies of recent failed toll roads; and
- Appendix B presents Census data used for estimating average weekly earnings.
3. NET COMMUNITY BENEFIT

29. A cost benefit analysis (CBA) estimates the community welfare (or ‘wellbeing’) impacts of a transport, urban planning or other public policy initiatives and projects.\(^1\) The principal objective of CBA is to assist decision making that is consistent with ‘efficiency’ in the allocation of resources in areas where, for one reason or another, market forces do not guarantee an appropriate outcome.

30. The power of CBA as an analytical tool lies in two main features:

- Costs and benefits are, as far as possible, expressed in monetary terms and hence are directly comparable with one another; and
- Costs and benefits are valued in terms of the claims they make on, and the gains they provide to, the triple\(^2\) bottom line as a whole, so the perspective is a ‘society-wide’ one, rather than that of any particular individual, organisation or group.

31. A CBA must address the full spectrum of environmental, social and business impacts of the proposal at hand. Positive and negative effects are quantified and monetised (expressed in dollar terms) as far as possible, and then compared, to arrive at a conclusion as to whether the proposal is likely to make the community better off, or worse off, in net terms.

32. In short, CBA examines whether a policy initiative or project will provide a net community benefit, taking into account that the resources deployed in implementing the initiative or project have alternative productive uses. To reiterate, all impacts of the proposed project versus the base case must be taken into account, whether or not they are ‘traded effects’ or ‘externalities’.

33. As the name implies, traded effects have a price in the market. For example, the cost of fuel has price which can be observed in market transactions. Fuel savings can be estimated and monetised based on the observed traded values. Externalities (e.g. traffic noise, loss of open space) on the other hand are unpriced costs and benefits sustained by third parties in any market transaction.

34. The used to assess the net community benefit of the North East Link is contained in the North East Link Business Case CBA.\(^3\) The North East Link Business Case follows standard approaches for assessing toll roads.

35. These standards have been set by the Australian Transport Assessment\(^4\) and Planning Guidelines and relevant Victorian Government standards. In recent history, other toll road projects were assessed using these same standards and produced positive BCRs. However, upon their opening, it was found that many of benefits which had supported the positive BCR were merely theoretical and did not play out in the real world.

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\(^2\) Environmental, social and business impacts


\(^4\) [https://www.atap.gov.au](https://www.atap.gov.au)
36. Using expected traffic volumes as a metric, here are several examples:

- Brisbane Airport Link – Forecasted opening traffic 136,000 vehicles per day, actual traffic 53,000 vehicles
- Clem7 Tunnel in Brisbane – Forecasted opening traffic 126,000 vehicles per day, actual traffic 53,000 vehicles
- Lane Cove in Sydney – Forecasted opening traffic 115,000 vehicles per day, actual traffic 58,000 vehicles
- Cross City Tunnel in Sydney – Forecasted opening traffic 90,000 vehicles per day, actual traffic 34,000 vehicles

37. In the face of these low traffic volumes, each of these toll roads experienced a rapid financial collapse. These previous toll road projects have overestimated the travel time savings and drivers’ propensity to use the toll road, to the point where the toll roads have been financial disasters. These toll roads have had a number of similar characteristics:

- They were ‘brownfield’ projects which required expensive tunnelling;
- The roads themselves are relatively short (in distance) and hence travel time savings were limited (or the aggregation of many small time savings); and
- They did not significantly improve accessibility to key employment hubs.

38. The North East Link appears to share these characteristics. This does raise concerns of optimism associated with the project benefits. The Australian Government commissioned a research paper in 2012 *Disincentivising overbidding for toll road concessions*. This research paper provides some insights into the issues around the transport modelling of toll roads. This included the unpredictability of traffic projections generally, and the sizeable upwards bias seen in many toll road appraisals.

39. A key risk is that actual travel volumes differ to the forecasts. Broadly, there are three elements of risk for new toll roads such as North East Link:

- Base demand risk – the risk associated with predicting the number of vehicles that will use the new road once traffic levels have reached a consistent level for a given toll;
- Ramp-up period risk – the risk associated with predicting how rapidly traffic volumes will grow from day one volumes to the base demand forecasts; and
- Long-term growth risk – the risk associated with how general traffic volumes will grow in the medium to long-term. These risks change over time as traffic volumes on a toll road is proven.

40. Further issues related to North East Link include the project’s impacts on the transport network and local community during the construction period. Geotechnical risk is also added, as a significant tunnelling component is included in the project to accommodate the road, within an environmentally sensitive part of Victoria.

41. The project has a very high capital cost as a consequence of the issues outlined above. This tends to have a multiplying effect on a range of project design and construction risks. The phased delivery of the full project creates technical, operational, and commercial interface risks in relation to the efficient delivery of the project.

42. By examining these toll road failures, it is evident the application of the standard approaches does not always match the reality. Using the learning from these failed toll roads and from successful toll roads, the robustness of net community benefit of the proposed North East Link will be assessed.

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4. PROJECT OVERVIEW

4.1 Summary of the North East Link Project

43. As currently proposed, North East Link is Victoria’s most expensive road project. The North East Link will provide a new freeway connection between the M80 Ring Road and an upgraded Eastern Freeway. The road project has three components:

- M80 Ring Road to the northern portal – From the M80 Ring Road at Plenty Road and the Greensborough Bypass at Plenty River Drive, North East Link would extend to the northern tunnel portal near Blamey Road. New road interchanges would be provided at the M80 Ring Road and Grimshaw Street;
- Northern portal to southern portal – At the northern portal of the tunnel, the road would transition into twin tunnels that connect to Lower Plenty Road via a new interchange before travelling under residential areas, Banyule Flats and the Yarra River to a new interchange at Manningham Road. The tunnel would then continue to the southern portal; and
- Eastern Freeway – From around Hoddle Street in the west through to Springvale Road in the east, modifications to the Eastern Freeway would include widening to accommodate future traffic volumes.

44. Figure 1 shows the project corridor, with activity centres and business hubs marked.
45. The North East Link Business Case lists the following as the objectives for the project:

- Improve business access and growth in Melbourne’s north, east and south east;
- Improve household access to employment and education in Melbourne’s north, east and south east;
- Improve freight and supply chain efficiency and industrial growth across the north, east and south east; and
- Improve access, amenity and safety for communities in the north east.

4.2 What has not been considered

46. This section contains a high-level assessment of the rationale for the North East Link Project, by outlining what the Business Case and Environment Effects Statement have not considered.

Future rail links not considered

47. The Business Case states that the cost of airport journeys from the north, east and south east is increasing, but does not consider how the proposed Airport Rail Link can improve access for the east and south east via the existing rail network in 2036.6

48. For example, the Business Case states that without a direct orbital link between the eastern suburbs and the Airport, a car trip from Ringwood to Melbourne Airport would take 70 minutes during AM peak. With the Airport Rail Link in place, a public transport trip between Ringwood and the Melbourne Airport and would take around 60-65 minutes (36 minutes from Ringwood to Southern Cross) then 25-30 minutes from Southern Cross to Melbourne Airport.

49. While cost and personal preferences will determine which mode of transport someone making this trip will choose, this is one of many examples of where the Business Case ignores other options to solve the challenges put forward.

50. In a more practical sense, the Business Case does not explicitly describe the potential impact the Airport Rail Link would have on trips on the North East Link and hence the implications this would have on the benefits of the project (this is discussed in more detail in Section 5.3).

51. The Airport is an important destination for the North East Link as shown in Figure 2. Figure 2 shows that the Airport has the one of the largest benefits for any location across Melbourne.

52. Furthermore, in terms of access to the Airport, there is no sensitivity analysis on the impact the proposed Suburban Rail Loop will have on accessibility to the Melbourne Airport. Considering the Suburban Rail Loop was announced in November 2018, and the Business Case released in February 2018, this is understandable. However, the EES was released in April 2019, but still does not provide any sensitivity testing to evaluate the impact of the Suburban Rail Loop.

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6 The Melbourne Airport Rail Link is part of the 2051 transport base case (NEL Business Case Appendix R Transport Modelling Report (Page R19)).
53. The opening of the South Eastern and North Eastern sections (which would provide access from the North East Link corridor to the Airport) of the Suburban Rail Loop could be within ten years of the opening of the North East Link. This is based on my understanding of the proposed Suburban Rail Loop.

54. There would be a risk that the Suburban Rail Loop would erode the long-term benefits of the North East Link and reduce the BCR.

55. Figure 3 presents the road and rail improvements assumed as part of the North East Link Transport Modelling. Neither the Airport Rail Link nor the Suburban Rail Loop were considered in the linking of the project. The Melbourne Metro 2 (Newport to Clifton Hill via Melbourne CBD) is also not considered to be in operation in 2036. However, that project does not currently have a comparable status to the other two rail projects and is less likely to be operational by 2036. Figure 3 also shows that there is an assumption that there are no significant improvements to the Hurstbridge Line by 2036.

56. Interestingly, the opening of the Melbourne Metro 2 in 2051 is included as a sensitivity test for the North East Link and this reduced the transport benefit by 1 per cent.

57. The impact of the missing rail projects is discussed in more detail in Section 5.3.

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NEL Business Case Appendix Q1 Economic Appraisal (Page 68)
Explaining the access improvements

58. A stated objective of the North East Link is for improved access to employment in Melbourne’s north, east and south east. Figure 4 outlines locations across Melbourne where households gain a benefit from the project in 2036. The south east appears not to gain any significant net benefits with a mixture of marginal positives and small negatives.

59. There are also household transport benefits accruing to the yet to be developed suburbs north of Epping and Mernda. A significant amount of the benefits of the project are depending on development of these greenfield areas before 2036.

60. The bulk of the benefits accrue in the established north eastern suburbs of Greensborough, Eltham, Montmorency and Briar Hill. Many of these locations are within the catchment for Rosanna Road (as shown in Figure 5).

61. In broader terms, the accessibility benefits are not flowing to those travelling from the M80 to the Eastern Freeway, but rather short trips between those two existing motorways.

62. The key to the accessibility improvements is the willingness of drivers to pay the North East Link toll to save time, rather than continue on the un-tolled alternative. This will save them time and allow another motorist to travel more quickly due to reduced congestion. Free alternatives contributed in a large part to the failure of the Lane Cove and Cross City Tunnels in Sydney.

63. It can also be seen with Parramatta Road (a free road) and the M4 tolled road, also in Sydney. The M4 was a tolled and then un-tolled road. It returned to be a tolled road in 2017, this saw a drop of 40,000 vehicles, as drivers returned to free alternative link Parramatta Road. The key question is whether the North East Link transport modelling will reflect real world behaviour. This question is explored further in section 5.3 Project Benefits.

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FIGURE 4: DISTRIBUTION OF HOUSEHOLD (COMMUTER) TRAVEL TIME BENEFITS BY ORIGIN

Source: NEL Business Case Page 8-29

FIGURE 5: LOCAL ROSANNA ROAD CATCHMENT

64. The Business Case also provides an assessment of changes in accessibility to jobs and tertiary education places. Changes in accessibility are different to hours saved (as shown above in Figure 5) as they reflect potential trips rather than actual trips.

65. These maps show a perplexing pattern, with some areas around Monash University showing the same increases in access to tertiary places as a result of the North East Link as locations with direct access to the project.

66. The changes in the access to jobs map shows a similar pattern with a very diffused pattern of accessibility improvements across large parts of Melbourne, which are just as high as the accessibility improvements to locations with direct access to the project.

67. The question is, how realistic is it that the removal of local trips between the M80 and Eastern Freeway have such very large changes in accessibility 20 kilometres away. The pattern of improved accessibility matches closely the alignment for the Suburban Rail Loop (see Figure 8). This reinforces the need to understand the impact of the Suburban Rail Loop on the net community benefit of the North East Rail Link.
68. The options analysis considered by the North East Link Business Case is explored further in the next section.
4.3 Options Analysis

69. The Business Case assessment of options is very high level and does not provide a comprehensive assessment of alternatives. The strategic options section of the Business Case is around 15 pages long. By comparison, the options analysis chapter of the Melbourne Metro Business Case\(^9\) runs to 40-50 pages. The Westgate Tunnel Business Case\(^10\) options analysis is around 25 pages. This helps to highlight how limited the assessment of alternative options is, as contained within the North East Link Business Case.

70. Table 1 presents the evaluation of the strategic options contained within the Business Case. The scoring of the various options is opaque, and the supporting text is at times confusing.\(^11\)

### TABLE 1: EVALUATION OF STRATEGIC OPTIONS

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
<th>Option 4</th>
<th>Option 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of full benefit to be delivered</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>55%</td>
<td>75%</td>
</tr>
</tbody>
</table>

- Benefit 1: Economic growth, 30%
- Benefit 2: Increased economic opportunity for households, 25%
- Benefit 3: Improved competitive-ness of the State, 20%
- Benefit 4: Improved liveability, 25%

<table>
<thead>
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<th>Cost</th>
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<td>Estimated capital investment cost (Range)</td>
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<td>$60b-$75b</td>
<td>$7b-$15b</td>
<td>$8b-$16b</td>
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<td>Estimated operational costs (Range)</td>
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<td>$1b-$2b pa</td>
<td>$0.5b-$1b pa</td>
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<td>Time (Range)</td>
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<td>10+ years</td>
<td>~10 years</td>
<td>~10 years</td>
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<tr>
<td>Risks</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Dis-benefit</td>
<td>Moderate</td>
<td>Moderate to High</td>
<td>Moderate</td>
<td>Low to moderate</td>
<td>Low to moderate</td>
</tr>
<tr>
<td>Ranking (Lowest ranking = preferred response)</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
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</table>

Source: NEL Business Case Page 4-12

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\(^11\) For example, the public transport & freight option (Option 3) was described as "These investments are expected to improve some orbital connectivity and will facilitate economic and employment opportunities in the north east by giving businesses and residents direct access to the La Trobe NEIC." While North East Link Option 5 was stated to ‘the improve access to major employment centres, particularly the La Trobe NEIC’ despite the La Trobe NEIC not having direct access to the North East Link.
The public transport & freight option is a perplexing combination of initiatives. In terms of public transport, it included:

- Increasing the frequency of SmartBus services (Routes 901 and 902);
- Constructing a spur line from the Hurstbridge railway line to the La Trobe National Employment & Innovation Cluster (NEIC) or extending tram route 86 with feeder buses to the La Trobe NEIC.

The freight component included constructing an intermodal freight rail network by upgrading existing passenger rail links to connect the Interstate Freight Terminals in the north (Donnybrook) and south east (Dandenong).

Bundling together these two very different sets of initiatives was estimated to cost $65-$70 billion. Given that increasing the frequency of SmartBus services and a spur line or an extension of 86 Tram would not be a megaproject, almost all the $65-$70 billion would have been allocated to the Interstate Freight Terminals and rail improvements.

This gold plating of the option would have ensured that Option 3 would not have scored higher than its third place ranking. This raises the question of the robustness of the options analysis, which lead to the North East Link being selected as the preferred option.
5. ASSESSMENT OF COSTS & BENEFITS

5.1 Overview

75. Table 2 presents a summary of the CBA results for the North East Link. The CBA suggests that the project will deliver a net benefit to the community. The total net present value of benefits is $2.2 billion greater than the capital and operating costs of the project.

76. The BCR of the base scenario when considering transport benefits only, is estimated to be 1.25.\textsuperscript{12} If wider economic benefits (those project benefits not currently accepted as core benefits within the transport appraisals guidelines) are included, this value increases to $1.35 for every dollar of cost.\textsuperscript{13}

<table>
<thead>
<tr>
<th>TABLE 2: BASE SCENARIO COST BENEFIT ANALYSIS RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital expenditure costs (capex)</td>
</tr>
<tr>
<td>$12,241m</td>
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<tr>
<td>Operational expenditure (opex)</td>
</tr>
<tr>
<td>$3,276m</td>
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<tr>
<td>Total project costs</td>
</tr>
<tr>
<td>$15,517m</td>
</tr>
<tr>
<td>Transport benefits</td>
</tr>
<tr>
<td>$103,531m</td>
</tr>
<tr>
<td>Wider Economic Benefits (WEBs)</td>
</tr>
<tr>
<td>$7,494m</td>
</tr>
<tr>
<td>Total project benefits</td>
</tr>
<tr>
<td>$111,025m</td>
</tr>
<tr>
<td>Net present value (NPV) - Transport only</td>
</tr>
<tr>
<td>$2.187m</td>
</tr>
<tr>
<td>Benefit Cost Ratio (BCR) - Transport only</td>
</tr>
<tr>
<td>1.3</td>
</tr>
<tr>
<td>Net present value (NPV) - Transport + WEBs</td>
</tr>
<tr>
<td>$3.077m</td>
</tr>
<tr>
<td>Benefit Cost Ratio (BCR) - Transport + WEBs</td>
</tr>
<tr>
<td>1.4</td>
</tr>
</tbody>
</table>

Source: NEL Business Case Appendix Q1 Economic Appraisal (Page 62)

77. As discussed earlier, other toll road projects were assessed using these same standards and produced a higher BCR. However, upon their opening, it was found that many of benefits which had supported the positive BCR were merely theoretical and did not play out in the real world.

78. The next sections examine the robustness of the costs and benefits, referencing reviews of historical projects.

\textsuperscript{12} $10,840 million divided by $8,653 million is equal to 1.253. In Table 2, this value is rounded to 1.3.

\textsuperscript{13} $11,730 million divided by $8,653 million is equal to 1.35. In Table 2, this value is rounded to 1.4.
5.2 Project Costs

Understated construction costs

79. Transport projects like the North East Link have ‘P50’ and ‘P90’ cost estimates, which identify the cost for which it is expected that a project will meet or better its budget in 50 or 90 per cent of cases.

80. The stated cost of the project contained within the Business Case is $15.5 billion. This is the P50 total real cost for both capital costs ($12.2 billion) and operating and maintenance costs ($3.3 billion). The P90 value is $16.5 billion. This represents roughly a 7 per cent ‘margin for error’ in the cost estimates. Using the P90, the BCR is 1.15 compared to 1.25 under the P50 cost.

81. Detailed analysis by the Grattan Institute\textsuperscript{14} has shown that Australian transport projects have had cost overruns much higher than suggested by the P90, while on average projects have P90 that is 9.2 per cent higher than the P50. The actual outcome was costs 26 per cent higher than the P50 expected.

82. The Grattan report detailed how both road and rail projects suffer from cost overruns. The average magnitude of cost overruns as a proportion of initial project costs on Australian transport infrastructure projects, completed between 2001 and 2015, by project mode, is shown in Figure 9.

FIGURE 9: ROAD AND RAIL PROJECTS COST OVERRUN (PER CENT)

![Figure 9: Road and Rail Projects Cost OVERRUN (PER CENT)](source)

Source: Grattan Institute: Cost Overruns in Transport Projects

83. Figure 10 highlights that there has already been a significant increase in the cost of the North East Link Project. This doesn’t necessarily mean the project has already experienced its ‘cost blow out’.

84. Even since the preparation of the Business Case and Environment Effects Statement, the likelihood of an unexpected construction cost upsurge has increased. The infrastructure boom across Melbourne and Sydney has seen the pressures on contractors increase with scarce resources (skilled workers, raw material, construction equipment) in an environment of ever-increasing demand.\textsuperscript{15}

85. The average project cost overrun is 26 per cent, for road projects it is closer to 30 per cent and for rail projects it is around 16 per cent. Using an average for all transport projects, a 26 per cent budget overrun would see the cost of the North East Link exceed the benefits (BCR of 0.99).

**EastLink Tunnel duplication could be part of the construction cost**

86. If the traffic volumes on the Eastern Freeway increase significantly there could be a requirement to increase the capacity within the EastLink tunnels (Melba and Mullum Mullum).

87. There has been no assessment in the published Business Case or Environment Effects Statement of the impact of the North East Link on traffic volumes in the existing EastLink tunnels. Figure 11 shows that there is an uplift in traffic along EastLink with the North East Link in operation.

88. The traffic volumes with the North East Link Project could require duplication of the existing EastLink tunnels. More detailed analysis would be required to estimate the cost of the duplication of the Melba and Mullum Mullum tunnels.

89. To provide some sense of scale of the cost, the 4.4 kilometre tunnels between Clifton Hill and CityLink for the proposed East West Link were estimated to have a cost of around $5.5 billion. Using this as an estimated guide, the 1.6 kilometre EastLink tunnels would be in the order of $2 billion in net present value terms. This additional cost would result in the project having a BCR of 1.02 compared to the Base Case of 1.25.

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17 Source: Banyule City Council, Boroondara City Council and Whitehorse City Council Submission on North East Link Project: Environment Effects Statement works approval application and draft Planning Scheme Amendment Page 7.
Forgotten Costs

90. There are other forgotten costs within the Business Case, including the permanent loss of around 30 hectares of open space and loss of other open space during the construction period (around 7 years). This could have been valued based on visitation to these sites and a value of time method. The loss of native vegetation and the additional areas of open space to be used for new stormwater infrastructure has also not been properly accounted for in the net community benefit calculation.

91. There has been no assessment in the Business Case or Environment Effects Statement to estimate the cost of business disruption caused by the North East Link. This disruption can take the form of:

- Acquisition of land which impacts on business operations;
- Disruption of business activity (e.g. reduced access for customers and reduced amenity impacting on passing trade) during the construction phase; and
- Disruption of business activity (e.g. reduced access for customers and reduced amenity impacting on passing trade) during the operational phase.

92. For example, the permanent acquisition of industrial land in Bulleen will displace businesses and reduce the number of jobs available for workers in this area. The Environment Effects Statement notes that the reduction in local employment is likely to be significant around Bulleen. Also, around 6 per cent of employment\(^\text{18}\) in the Watsonia Statistical Area could also be displaced as a result of permanent land acquisitions for North East Link.

93. As part of the Environment Effects Statement, businesses were interviewed and responded stating that they intended to physically expand or upgrade their business facilities over the next five years. Some businesses have put these plans on hold due to potential land acquisition and uncertainty about future operations. This indicates

\(^{18}\)NEL EES – Chapter 14 Business (Page 14-18)
that North East Link may already be having an adverse impact on business operations and viability in the precinct.  

94. Some of these businesses could successfully relocate elsewhere in Victoria, although it is possible the business displacement could be fatal for some businesses. The cost of reduced economic activity should be considered as part of the net community benefit.

95. While staff would not be directly impacted before business relocation is attempted, some businesses surveyed expressed concern that perceived uncertainty about the future among employees could increase staff turnover.

96. Potential permanent and temporary land acquisition could reduce the local availability of employment and services. This is due to the uncertainty and insecurity of employment, which could increase the staff turnover rate and reduce business capacity to hire staff. These impacts should be considered as costs as part of the net community benefit.

97. During the construction and operational phases of the North East Link, noise and amenity impacts, resulting from redistribution of traffic due to operation of North East Link, may reduce the viability of businesses and commercial facilities whose operation is sensitive to access and amenity impacts.

98. The Melbourne Metro EES assessed the impact on business and the local economy as a result of construction, disruption and acquisition of business. The North East Link Environment Effects Statement should have done the same.

99. While these forgotten costs would not be in the hundreds of millions of dollars, they should have been included in the assessment of the North East Link Project.

5.3 Project Benefits

100. In terms of the distribution of transport benefits (see Figure 12), freight users will be the greatest beneficiaries of the project, with around $4.1 billion in benefits provided over the appraisal period. This accounts for approximately 37 percent of the total transport benefits. There will also be significant benefits provided to households (from commuting and other trips) and business users, with around $3.6 billion and $2.7 billion in benefits respectively over the appraisal period.

![Figure 12: Distribution of Transport Benefits ($2017, Present Value)](source: NEL Business Case Page 10-11)

19 Page 14 EES Chapter 14 Business
Business trip benefits appear overstated

101. Business trips account for 25 per cent of the benefits of the project, which is hard to reconcile given the location of the North East Link. The Business Case states that North East Link will improve better business-to-business connectivity by reducing travel times and associated costs between key employment clusters and activity centres in the north, east and south east, including La Trobe NEIC and Box Hill, Monash, Ringwood and Dandenong.

102. However, when examining the distribution of business benefits, the bulk of the benefits accrue in Coburg and Preston and the mostly residential Greensborough, Eltham, Montmorency and Briar Hill. The new residential suburbs of north of Epping and Mernda appear to make up a significant percentage of business benefits. It is difficult to reconcile the text in the Business Case and the map of business trip benefits.

103. When comparing the business trip and household trip benefits, the areas south of Greensborough both have between 25,000 and 30,000 hours saving for business trips and 30,000 and 35,000 household trip benefits. This is a somewhat confusing outcome as these areas are predominantly residential and do not have large employment concentrations. It is difficult to see a scenario that business trips would be saving almost as many hours as household trips in a predominantly residential area.

104. The same pattern is seen in the future growth areas to the north of Epping. Largely residential areas are seeing very high business trip savings. However, no justification is made within the Business Case or Environment Effects Statement for the very high number of business travellers benefits relative to other types of vehicles benefiting from the North East Link.

105. This bias towards business trips has a significant impact on the benefits attributed to the North East Link. This is driven by the high cost of time assigned to business travellers ($52.61 per hour) compared with commuters ($16.22 per hour). This large difference in hourly value of time is in line with Australian Transport Assessment and Planning guidance, but it means every hour of a business trip is valued at more than 3 times the value of a commuter trip.

106. The $52.61 hourly value is based on Victorian average weekly earnings. When comparing Victorian average weekly earnings with the study area, from ABS Census data, the study area looks to have average weekly earnings of around 11.4 per cent less than the state average.

107. The Business Case appears to assume that 18 per cent of all vehicle kilometres trips are business trips. This is based on the Victorian average rather than local conditions. Examining available data from the Victorian Integrated Survey of Travel and Activity would suggest a more appropriate ratio for the study area would be around 14 per cent, rather than 18 per cent. This means that the business trips are overstated by 22.2 per cent.

108. Using this local value of business travel and lower split of business trips, the present value of the business benefit would fall to approximately 32 per cent of the current level – a reduction of $0.8 billion in benefits. This would reduce the BCR from the from 1.25 to 1.16. This highlights how important the assumption around the number and value of business trips is to justify the entire project. Given the strange

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20 Source: NEL Business Case Page 8-13
21 Referencing La Trobe, Box Hill, Monash, Ringwood and Dandenong gaining benefits.
22 The Census data underpinning this calculation is presented Appendix B.
24 Initial business benefit was $2,690 million. $2,690 million * 0.886 (reflecting lower average wages) * 0.778 (reflecting lower percentage of business trips).
pattern of the business trip benefits, this raises a significant question around the robustness of the project benefits.

FIGURE 13: DISTRIBUTION OF BUSINESS TRAVEL TIME BENEFITS BY DESTINATION DUE TO NORTH EAST LINK

Source: NEL Business Case Page 8-14

Impact of Airport Rail Link and Suburban Rail Loop

109. As discussed previously in this document, there is no sensitivity analysis on the impact of the Airport Rail Link and Suburban Rail Loop. Without detailed modelling it is very difficult to assess the impact. Although the Business Case does provide some clues.

110. A sensitivity analysis in the Business Case shows that a constrained public transport network boosts project benefits by 17 per cent (see Table 3). Applying the same logic, a boost in public transport network would reduce benefits by 17 per cent. This reduced the BCR to 1.04.

111. Given this applies to the current public transport network, this scenario would not be reflecting the impact of the Suburban Rail Loop. The Business Case pessimistic case presents a scenario where benefits realised by the project are lower than expected. This produces a BCR of 0.5 (see Table 4). This may be a better representation of the potential impact of the Suburban Rail Loop.
112. The midpoint BCR between the constrained public transport network and the pessimistic case is a BCR of 0.77. This could provide an insight into the impact of the Suburban Rail Loop and Airport Rail Link.

Travel time saving benefits are unreliable

113. In a review of the Lane Cove Tunnel and Cross City Tunnel failures, the NSW Roads and Maritime Services (RMS) describes that “the majority of travel time savings were less than five minutes (which are often not realised and can be considered inframarginal in economic terms)”. Inframarginal means that they are within the margin of error of the modelling or/and cannot be observed by road users. In the case of the Lane Cove Tunnel, when travel time savings of less than five minutes were removed from the analysis, the BCR decreased by approximately 50 per cent.

114. The Business Case and Environment Effects Statement do not provide a breakdown of the distribution of the travel time savings. For example, what percentage of total North East Link travel time savings come from trips which are

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saving less than 1 minute, between 1 and 5 minutes, between 5 and 10 minutes and greater than 10 minutes.

115. The transport appendix does provide six travel time routes (as shown in Figure 14) and the travel time savings associated with the North East Link Project in a variety of directions.

FIGURE 14: NORTH EAST LINK STUDY AREA TRAVEL TIME ROUTES


116. Travel times are typically highest in the ‘peak direction’ such as the AM peak westbound/southbound or PM peak eastbound/northbound. Travel times in the ‘counter-peak direction’ (AM peak eastbound/northbound and PM peak westbound/southbound) are typically faster and are more representative of off-peak conditions.

117. As shown in Figure 15 there are 28 combinations of travel times. Only seven of these travel times have travel time savings of greater than five minutes. It would be very unlikely that short local trips would be experiencing travel time savings of greater than five minutes. Figure 16 also shows that the road network is relatively congested outside of the morning peak period, so there would be even smaller travel time savings.
FIGURE 15: FORECAST TRAVEL TIMES, AM PEAK WESTBOUND/SOUTHBOUND – 2017, 2036 ‘NO PROJECT’ AND 2036 ‘WITH PROJECT’

FIGURE 16: NORTH EAST LINK STUDY AREA ROAD CONGESTION NON PEAK PERIODS

WEEKDAY 9AM  
WEEKDAY 4PM  

Source: Google Maps
This analysis confirms that the short travel time savings would be an issue with the North East Link. The various Business Case and Environment Effects Statement documents do not provide any insight into the scale of the problem. As mentioned earlier with the Lane Cove Tunnel, the BCR was reduced by half.

Analysis of the WestConnex Project\(^{26}\) in Sydney saw that removing travel time savings of less than five minutes, reduced travel benefits by 55 per cent.\(^{27}\)

Applying these two case studies to the North East Link would see the BCR reduce to between 0.55 (WestConnex Case Study) and 0.64 (Lane Cove Case Study).

Benefits sensitive to expansion factors

An expansion factor is used to convert average weekday benefits into an annual figure. The expansion factor used by the Business Case is 330. This assumes that the benefits generated on an average weekday by North East Link would be generated for 330 days per year.

Current guidance does not provide specific annualisation factors to be used in the economic evaluation of a transport infrastructure project, but rather states that ‘the specific characteristics of the network in which the project being assessed is located should be key considerations in the determination of daily and annual expansion factors’.\(^{28}\)

Analysis is provided based on Melbourne wide data, which is likely to overestimate the traffic conditions in the north east of Melbourne.

There are 260 weekdays in a calendar year. Further to this, school holidays and public holidays make up 68 days of the year, and these typically have lower traffic levels. This leaves 192 days where the peak periods would be replicated by the transport model.\(^{29}\)

The expansion factor that is used increases benefits by about ten per cent compared to a more conservative expansion factor of 300. With a factor of 300, the BCR would fall from 1.25 to 1.14.

This highlights how sensitive the transport benefits are to a more conservative assumption.

5.4 Risk adjusted analysis

The previous two subsections have explored where there are risks of the North East Link costs being higher than expected and benefits lower than expected to highlight scenarios where there is not a net community benefit.

The Business Case economic appraisal also attempted this type of analysis. Estimates of uncertainties around project costs and benefit were combined to show the impact on the BCR by calculating an overall distribution using a ‘Monte Carlo’ analysis.


\(^{27}\) WestConnex Business Case Review (Page 31)

\(^{28}\) REF EY economic analysis report

\(^{29}\) NEL Business Case Appendix R1 Transport Modelling Report (Page 49) states “The Zenith model parameters are calibrated using VISTA household travel surveys collected for an average weekday during school term (AWDT). This excludes weekends, school holidays and public holidays. The model is then validated against traffic volumes collected for an average weekday (during school term), and non-typical surveys not included (eg outliers caused by incidents and faulty data collection). As a rule of thumb, VicRoads data indicates that average weekday (during school term) traffic volumes (AWDT) are approximately 5 to 10% higher than the average annual daily traffic (AADT)”.

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128. Figure 17 shows the distribution of the BCR and confidence levels associated with different outcomes. 15.6 percent of potential combinations of cost and benefit would lead to a BCR less than one, while 9.7 percent of scenarios would lead to a BCR greater than two.

129. Table 5 shows a comparison of the project costs and benefits for the base case scenario and the risk adjusted scenarios. The risk-adjusted scenario represents the average from all simulations from the Monte Carlo analysis.

130. Very strangely, the risk adjusted costs are no different from the Base scenario. Hence the risk adjusted analysis suggests that there is no risk of costs blowing out on the North East Link project, while there is a risk that benefits would be higher than expected. Given the history of toll road projects this would seem a unlikely risk-adjusted outcome.

**TABLE 5: EVALUATION OF STRATEGIC OPTIONS SUMMARY OF COST BENEFIT ANALYSIS**

<table>
<thead>
<tr>
<th></th>
<th>Base scenario</th>
<th>Risk-adjusted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital costs (SPV)</td>
<td>$8,191m</td>
<td>$8,191m</td>
</tr>
<tr>
<td>Operating and maintenance costs (SPV)</td>
<td>$462m</td>
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<td>Total project costs (SPV)</td>
<td>$8,653m</td>
<td>$8,653m</td>
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<tr>
<td>Transport benefits (SPV)</td>
<td>$10,840m</td>
<td>$10,840m</td>
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<tr>
<td>Net present value (NPV) - Transport only</td>
<td>$2,187m</td>
<td>$3,401m</td>
</tr>
<tr>
<td>Benefit Cost Ratio (BCR) - Transport only</td>
<td>1.3</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Source: NEL Business Case Appendix Q1 Economic Appraisal (Page 66)

131. The risk adjusted analysis in the Business Case appears to suffer from ‘optimism bias’ (that which arises from the combined impacts of cost underestimation and benefits overestimation), rather than fully stress testing the net community benefit of the project.

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130 This outcome aligns with Danish economic geographer Bent Flyvbjerg findings on the assessment of mega projects like the North East Link. After assessing many transport projects Flyvbjerg that come up with following phrase ”the iron law of megaprojects: over budget, over time, over and over again.”
6. CONCLUDING REMARKS

132. The proposed North East Link will be Victoria’s most expensive road project. Using relevant guidelines, an assessment of the net community benefit has been made. The assessment of net community benefit suggests that the North East Link will deliver a net community benefit. The BCR of the North East Link is estimated to be 1.25.

133. Other toll road projects were assessed using these same standards and produced positive BCR. However, upon their opening, it was found that many of benefits which had supported the positive BCR were merely theoretical and did not play out in the real world.

134. Using the learning from these failed toll roads and from successful toll roads, the robustness of net community benefit of the proposed North East Link was assessed. A list of the issues identified as part of this assessment include:

- The construction cost of the project appears conservative. A budget overrun is very likely and could result in the costs of the project outweighing the benefits;
- Not all costs have been accounted for in the analysis. The loss of open space and native vegetation and loss of economic activity have not been considered the assessment of the North East Link;
- The traffic volumes under the North East Link Project could require duplication of the existing EastLink tunnels. This cost should be included in the net community benefit assessment;
- The removal of small travel time savings from the transport modelling would reduce the BCR from 1.25 to around 0.6;
- Using the local value of business travel, the present value of the business benefit would fall to approximately 32 per cent. This would reduce the BCR from 1.25 to 1.16;
- There is no sensitivity analysis of the impact of the Airport Rail Link and Suburban Rail Loop. Without detailed modelling, it is very difficult to assess the impact of these rail projects. However, accounting for these projects could lower the BCR to 0.77.
- A more conservative expansion factor of 300 days would see the BCR fall from 1.25 to 1.14.

135. When considering the number of benefits that are likely to be overestimated and costs that may have been underestimated, it is very possible that there is no net community benefit from the North East Link.
Appendix A: Toll Road Case Studies

Cross City Tunnel

Initial project drivers and anticipated impacts

136. The Cross City Tunnel and Lane Cove Tunnel were developed in parallel, with strategic route development commencing in the late 1980s. These two projects and the M7 Motorway completed the Sydney Orbital and provided an east-west bypass of Sydney’s CBD. All three projects utilised the same development and approval processes. In particular, they were all assessed under Division 4, Part 5 of the EP&A Act and delivered under a Build, Own, Operate and Transfer contract. (RTA 2010)

137. Over the years there have been numerous proposals for east–west road tunnels under the Sydney CBD to relieve traffic congestion in the city, utilising a wide variety of alignments, including routes under Market and Park Streets. The basic concepts behind the project were developed by the RTA from the mid-1990s, and were first publicly aired in a 16 page public consultation report, The Cross City Tunnel: Improving the Heart of the City, released by the then Premier, Mr Bob Carr, and the then Minister for Roads, Mr Carl Scully, on 22 October 1998.

138. The preliminary concepts developed by the RTA at this stage involved much shorter two-lane tunnels than the final design, both of them passing under Druitt and Park Streets. The Cross City Tunnel motorway links the Western Distributor to New South Head Road and also connects to the Eastern Distributor. It takes traffic directly from the eastern suburbs to the northern parts of the Central Business District and then the northern suburbs via the bridge and harbour tunnel crossings.

139. The tunnel was designed to improve travel times for commuters by allowing traffic to travel below the city. The Cross City Tunnel project was intended to improve road safety and amenity in Sydney by removing traffic from the city centre and connecting major roads west and north of the city.

140. Construction work for the cross city tunnel commenced in January 2003, and the tunnel opened in August 2005. The tunnel is a toll road except for a three-week toll-free period shortly after its opening which was extended for a further two and a half weeks, until the end of November, 2005.

Funding and management

141. The Cross City Motorway Pty Ltd was contracted to build and operate the Cross City Tunnel. This was a privately owned, special purpose company created solely for the Cross City Tunnel project. Cross City Motorway Pty Ltd engaged the Baulderstone Hornibrook/Bilfinger Berger Joint Venture to design and construct the project.

142. The $680M tunnel was originally financed by a combination of international equity and locally and internationally sourced debt. Equity of $220M was provided by three international companies, Cheung Kong Infrastructure (50 percent), DB Capital Partners (30 percent) and Bilfinger Berger BOT (20 percent). The remaining $580 million was financed through a syndicate of Australian and international banks led by Westpac and Deutsche Bank.
143. The tunnel is scheduled to revert to public ownership in 2035.

144. In November 2006, it was reported that the motorway was in financial difficulties, and that additional equity would be required from the tunnel’s investors in order to avoid placing the tunnel in administration. At the same time, it was suggested by a banking analyst with JP Morgan that traffic volumes of between 60,000 and 90,000 per day were needed in order for the consortium to meet the tunnel interest payments. The NSW government responded to the reports by indicating that it would not buy out the tunnel, nor assist in its financing.

145. December 2006 the tollway became insolvent due to low traffic volumes, accumulating debts of over $500 million. On 20 June 2007, Leighton Contractors and investment bank ABN AMRO were chosen as preferred purchasers of the Cross City Tunnel Group for $700 million.

146. In September 2013 the new owner of the tunnel placed itself in voluntary administration, saying that it was unable to refinance its debt due to action by the New South Wales government to claim $64 million in stamp duty on the original sale. Transurban purchased the tunnel from the managers and receivers in June 2014 for approximately $475 million.

**Lane Cove Tunnel**

**Initial project drivers and anticipated impacts**

147. The Lane Cove Tunnel is 3.6 km, dual tunnel generally running below the alignment of Epping and Longueville Roads and connecting the M2 Motorway at North Ryde with the Gore Hill Freeway at Artarmon. It is owned by toll road operator Transurban and forms part of the M2 and the 110km Sydney Orbital Network. The Lane Cove Tunnel and Cross City Tunnel were developed in parallel, with strategic route development commencing in the late 1980s. These two projects and the M7 Motorway completed the Sydney Orbital and provided an east-west bypass of Sydney’s CBD.

148. The idea of building a Lane Cove Tunnel was first raised in the early 1990s when the Gore Hill Freeway opened. Several feasibility studies and rounds of public consultations followed, including a 1997 invitation to the community to comment on options for improving Epping Road identified in studies commissioned by the Roads & Maritime Services, which had suggested a tunnel under Epping Road between the Pacific Highway and a point just west of Centennial Avenue. Community feedback was strongly in favour of a longer tunnel. Later in 1997 an M2–Epping Road Task Force, comprising the mayors of Lane Cove, Willoughby, North Sydney and Ryde and the Parliamentary Secretary for Roads, was formed to lead community discussions on the options.

149. Six tunnel route options, involving both ‘long’ and ‘short’ tunnels under Mowbray Road West or Epping Road, were placed on public display in 1998, and community feedback on these options was obtained through discussions with the task force, public meetings and a questionnaire.

150. On 17 December 1999 the NSW Government invited public comments on a Lane Cove Tunnel Overview Report which summarised the findings of these initial investigations and identified a preferred tunnel option with twin two-lane tunnels, generally under Epping Road and broadly based on one of the six options identified in 1998. This Overview Report also proposed the widening of the Gore Hill Freeway to six lanes, the construction of north-facing ramps to and from the Warringah Freeway at Falcon Street in North Sydney and the funding of the project by tolls.
Funding and management

151. Connector Motorways owned and managed the Lane Cove Tunnel from 2006 to 2010. Connector Motorways awarded a $1.1 billion contract to design and construct the tunnel to a joint venture between Thiess and the John Holland Group. The tunnel was built to replace the few kilometres motorists had to drive along Epping Road, through the suburb of Lane Cove, between two sections of freeway.

152. Connector Motorways was supposed to operate the tunnel concession until 2037. However, the project went into receivership in January 2010 due to revenue losses. International toll road operator Transurban bought the tunnel in May 2010 for $630 million and became the new operator. Transurban is contracted to operate the road until 2037.

Clem 7 Tunnel

Initial project drivers and anticipated impacts

153. The Clem Jones Tunnel, known as Clem7 is a 6.8km toll tunnel that connects Brisbane’s inner north to the southern and eastern suburbs, bypassing the city centre. The tunnel was originally proposed by in 2001. The Clem7 connects to the AirportLinkM7 tunnel as well as five other major Brisbane traffic routes. The Clem 7 was opened to traffic in March 2010.

154. The Clem 7 Tunnel, known as the North South Bypass Tunnel during construction, is one of Brisbane’s largest road infrastructure projects aimed at addressing the existing and future transport needs of Brisbane. The project provides a direct north-south link without travelling through the CBD or Fortitude Valley. The project was the first plank in Brisbane City Council’s Plan to reduce congestion across the city.

155. The project is 6.8km in length from end to end and includes two 4.8km tunnels linking the Southeast Freeway and Ipswich Road in Woolloongabba; the Inner City Bypass and Lutwyche Road in Bowen Hills and Shafston Avenue in Kangaroo Point.

Funding and management

156. The Clem 7 Tunnel was built at a cost of $3.2 billion and is a motorway grade toll road under the Brisbane River. It was Brisbane’s first privately financed inner city toll road, the city’s largest road infrastructure project and one of Queensland’s largest infrastructure projects. The road was funded through a Public Private Partnership.

157. Construction bids were provided by a tender process in which RiverCity Motorway was selected over the Brisconnections consortium. The project commenced in September 2006. Contracts for design and construction were given to Leighton Contractors and Baulderstone/Bilfinger Berger Joint Venture.

158. Lower than expected revenue from tolls forced RiverCity Motorway into receivership. In December 2013, Queensland Motorways, operator of the Gateway and Logan motorways, took over tolling and operation. In July 2014, Queensland Motorways was acquired by a consortium led by toll road operator Transurban, which now manages and operates the tunnel. Transurban is contracted to operate the road until 2037.
## APPENDIX B: CENSUS DATA

### TABLE 6: CENSUS DATA USED TO ESTIMATE THE AVERAGE WEEKLY EARNINGS

<table>
<thead>
<tr>
<th>SA2</th>
<th>Negative Income N</th>
<th>$0-$19,999</th>
<th>$20,000-$39,999</th>
<th>$40,000-$59,999</th>
<th>$60,000-$79,999</th>
<th>$80,000-$99,999</th>
<th>$100,000-$124,999</th>
<th>$125,000-$149,999</th>
<th>$150,000-$199,999</th>
<th>$200,000-$299,999</th>
<th>$300,000+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Weekly Earnings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Census TableBuilder